# FLEX I/O
Remote I/O Adapter
(Cat. No. 1794-ASB Series D)
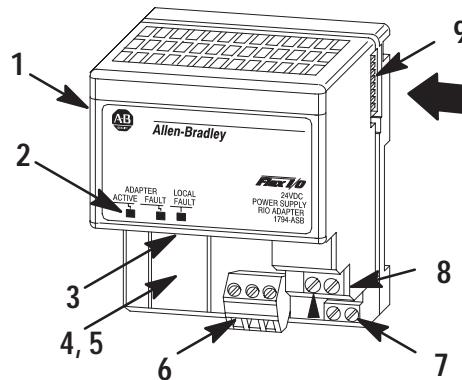
This Adapter module is shipped configured for Standard Addressing Mode. In Standard Addressing Mode, this module can be used as a replacement for 1794-ASB Series A or B remote I/O adapters.
Note: This adapter **cannot** be used with PLC-2 programmable controllers.This series D adapter can communicate with FLEX Integra analog modules.

Component Identification	
1	Remote I/O Adapter module
2	Indicators
3	Communication reset pushbutton (PRL)
4	Access door to switches S1 and S2
5	Switches S1 and S2 (behind access door)
6	Remote I/O cable connector
7	+24V dc connections
8	24V common connections
9	Flexbus connector

European Union Directive Compliance

If this product has the CE mark it is approved for installation within the European Union and EEA regions. It has been designed and tested to meet the following directives.

EMC Directive

This product is tested to meet Council Directive 89/336/EEC Electromagnetic Compatibility (EMC) and the following standards, in whole or in part, documented in a technical construction file:

- EN 50081-2EMC – Generic Emission Standard, Part 2 – Industrial Environment
- EN 50082-2EMC – Generic Immunity Standard, Part 2 – Industrial Environment

This product is intended for use in an industrial environment.

Low Voltage Directive

This product is tested to meet Council Directive 73/23/EEC Low Voltage, by applying the safety requirements of EN 61131–2 Programmable Controllers, Part 2 – Equipment Requirements and Tests.

For specific information required by EN 61131-2, see the appropriate sections in this publication, as well as the following Allen-Bradley publications:

- Industrial Automation Wiring and Grounding Guidelines For Noise Immunity, publication 1770-4.1
- Guidelines for Handling Lithium Batteries, publication AG-5.4

This equipment is classified as open equipment and must be mounted in an enclosure during operation to provide safety protection.

Mounting on a DIN Rail before installing the terminal base units
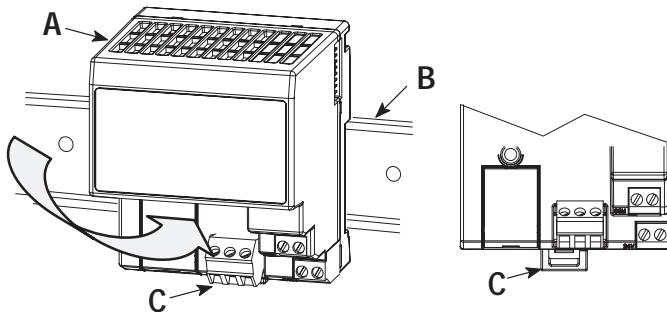
1. Hook the lip on the rear of the adapter **(A)** onto the top of the DIN rail **(B)**, and rotate the adapter module onto the rail.

2. Press the adapter module down onto the DIN rail until flush. Locking tab **(C)** will snap into position and lock the adapter module to the DIN rail.

3. If the adapter module does not lock in place, use a screwdriver or similar device to move the locking tab down while pressing the adapter module flush onto the DIN rail and release the locking tab to lock the adapter module in place. If necessary, push up on the locking tab to lock.

4. Connect the adapter wiring as shown under "Wiring" later in this document.

NOTE: For Panel/Wall mounting, refer to publication 1794-5.13, "Panel Mounting Kit, Cat. No. 1794-NM1."

Mounting (or Replacing) the Adapter on an Existing System

1. Remove the RIO plug-in connector from the front of the adapter.

2. Disconnect any wiring jumpered to the adjacent terminal base.

3. Using a screwdriver or similar tool, open the lock and remove the module from the base unit to which the adapter will be attached.

4. Push the flexbus connector toward the right side of the terminal base to unplug the backplane connection.

> ⚠ **ATTENTION:**   Make certain that the flexbus connector is completely clear of the adapter. The slide must be completely to the right and the raised spot on the slide visible.

5. Release the locking tab and remove the adapter.

6. Before installing the new adapter, notice the notch on the right rear of the adapter. This notch accepts the hook on the terminal base unit. The notch is open at the bottom. The hook and adjacent connection point keep the terminal base and adapter tight together, reducing the possibility of a break in communication over the backplane.
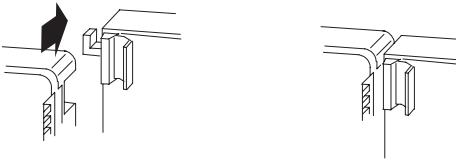
> ⚠ **ATTENTION:**   Make certain that the hook on the terminal base is properly hooked into the adapter. Failure to lock the hook into the adjacent base/adapter can result in loss of communication on the backplane.

7. Complete the adapter mounting as shown below.

Push down and in at the same time to lock the adapter to the DIN rail.

When the adapter is locked onto the DIN rail, **gently** push the flexbus connector into the adapter to complete the backplane.

C
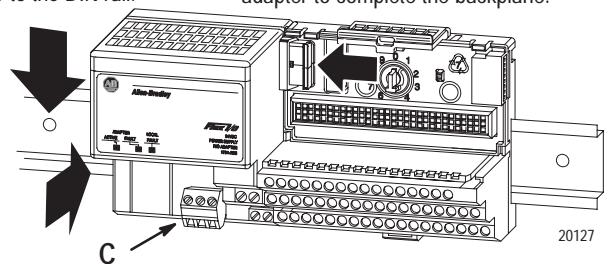
20127

8. If the adapter module does not lock in place, use a screwdriver or similar device to move the locking tab **C** down while pressing the adapter module flush onto the DIN rail. Then release the locking tab to lock the adapter module in place. If necessary, push up on the locking tab to lock.

9. Reinstall the module into the terminal base unit.

Wiring

20131
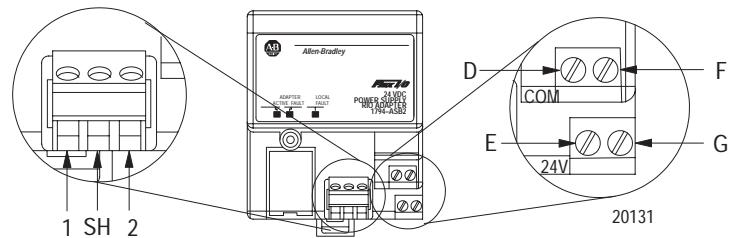
 ATTENTION: When connecting wiring, torque terminal screws to 7-9 inch-pounds

1. Connect the remote I/O cable to the removable remote I/O connector.

Connect	To
Blue Wire – RIO	1
Shield Wire – RIO	SH
Clear Wire – RIO	2

 ATTENTION: If this is the last adapter, you must terminate the remote I/O link here. Use a terminating resistor connected across terminals 1 and 2. Refer to your processor manual for information on the size of the resistor.

2. Connect +24V dc input to the left side of the lower connector, terminal **E**.

3. Connect 24V common to the left side of the upper connector, terminal **D**.

4. Connections **G** and **F** are used to pass 24V dc power (G) and 24V common (F) to the next module in the series (if required).

Set the Adapter Switches
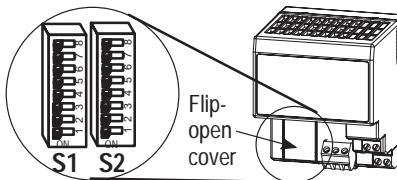
Set the Addressing Mode Switches

> ⚠ **ATTENTION:** Some switches on this adapter differ from the switches on previous versions. Make certain that you identify each switch before setting.

1. Lift the hinged switch cover on the front of the adapter to expose the switches.

2. Set the switches as shown below.

3. Cycle power to the adapter after setting the switches.

When Using this Addressing Mode	And	Mode 2 Switch 1-1	Mode 1 Switch 2-5	Mode 0 Switch 2-8
Standard (as shipped)	8 and/or 16- point modules	See note 1	ON	ON
Compact	8-point modules	OFF	ON	OFF
	16-point modules	ON	ON	OFF
Complementary	See Complementary Rack Addressing Table, page 10			
Primary chassis	8-point modules	OFF	OFF	ON
Complementary chassis		ON	OFF	ON
Complementary	See Complementary Rack Addressing Table, page 10			
Primary chassis	16-point modules[2]	OFF	OFF	OFF
Complementary chassis		ON	OFF	OFF

[1] In Standard mode, this switch retains its function as switch position 1 of rack addressing. In Standard mode, the module is functionally interchangeable with 1794-ASB Series A or B modules.

[2] When programming block transfers, address analog modules as module 0 if switch S1-1 is on; module 1 if switch S1-1 is off.
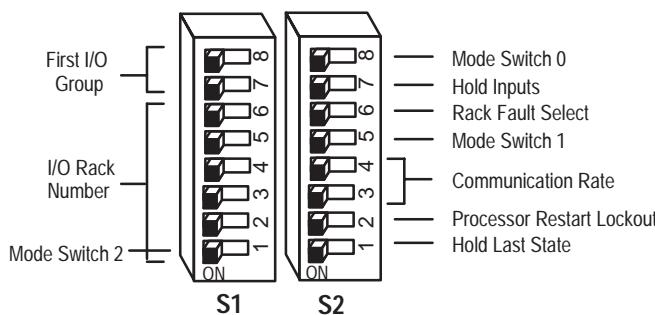
First I/O Group			I/O Rack Number
S1–8	**S1–7**	**I/O group**	**S1–6 thru S1–1**
ON	ON	0 (1st)	Refer to the table on page 8
OFF	ON	2 (2nd)	
ON	OFF	4 (3rd)	
OFF	OFF	6 (4th)	

S2–8	**Mode Switch 0**
Refer to Mode Selection Switches, page 6	

S2–7	**Hold Inputs**	**S2–6**	**Rack Fault Select**
ON	Hold Inputs	ON	Disabled (default)
OFF	Reset Inputs	OFF	Enabled

S2–5	**Mode Switch 1**
Refer to Mode Selection Switches, page 6	

Communication Rate			Processor Restart Lockout		Hold Last State	
S2–4	**S2–3**	**Bits/s**	**S2–2**	**Processor:**	**S2–1**	**Processor will:**
ON	ON	57.6k	ON	Restart	ON	Reset Outputs
OFF	ON	115.2k	OFF	Locked Out	OFF	Hold last state
ON	OFF	230.4k				
OFF	OFF	230.4k				

I/O Rack Number Switch Settings

Rack Number				S1 Switch Position					
1747-SN	PLC–5	PLC–5/250	PLC–3	6	5	4	3	2	1
Rack 0	Not Valid	Rack 0	Rack 0	ON	ON	ON	ON	ON	ON
Rack 1	Rack 1	Rack 1	Rack 1	OFF	ON	ON	ON	ON	ON
Rack 2	Rack 2	Rack 2	Rack 2	ON	OFF	ON	ON	ON	ON
Rack 3	Rack 3	Rack 3	Rack 3	OFF	OFF	ON	ON	ON	ON
	Rack 4	Rack 4	Rack 4	ON	ON	OFF	ON	ON	ON
	Rack 5	Rack 5	Rack 5	OFF	ON	OFF	ON	ON	ON
	Rack 6	Rack 6	Rack 6	ON	OFF	OFF	ON	ON	ON
	Rack 7	Rack 7	Rack 7	OFF	OFF	OFF	ON	ON	ON
	Rack 10	Rack 10	Rack 10	ON	ON	ON	OFF	ON	ON
	Rack 11	Rack 11	Rack 11	OFF	ON	ON	OFF	ON	ON
	Rack 12	Rack 12	Rack 12	ON	OFF	ON	OFF	ON	ON
	Rack 13	Rack 13	Rack 13	OFF	OFF	ON	OFF	ON	ON
	Rack 14	Rack 14	Rack 14	ON	ON	OFF	OFF	ON	ON
	Rack 15	Rack 15	Rack 15	OFF	ON	OFF	OFF	ON	ON
	Rack 16	Rack 16	Rack 16	ON	OFF	OFF	OFF	ON	ON
	Rack 17	Rack 17	Rack 17	OFF	OFF	OFF	OFF	ON	ON
	Rack 20	Rack 20	Rack 20	ON	ON	ON	ON	OFF	ON
	Rack 21	Rack 21	Rack 21	OFF	ON	ON	ON	OFF	ON
	Rack 22	Rack 22	Rack 22	ON	OFF	ON	ON	OFF	ON
	Rack 23	Rack 23	Rack 23	OFF	OFF	ON	ON	OFF	ON
	Rack 24	Rack 24	Rack 24	ON	ON	OFF	ON	OFF	ON
	Rack 25	Rack 25	Rack 25	OFF	ON	OFF	ON	OFF	ON
	Rack 26	Rack 26	Rack 26	ON	OFF	OFF	ON	OFF	ON
	Rack 27	Rack 27	Rack 27	OFF	OFF	OFF	ON	OFF	ON
		Rack 30	Rack 30	ON	ON	ON	OFF	OFF	ON
		Rack 31	Rack 31	OFF	ON	ON	OFF	OFF	ON
		Rack 32	Rack 32	ON	OFF	ON	OFF	OFF	ON
		Rack 33	Rack 33	OFF	OFF	ON	OFF	OFF	ON
		Rack 34	Rack 34	ON	ON	OFF	OFF	OFF	ON
		Rack 35	Rack 35	OFF	ON	OFF	OFF	OFF	ON
		Rack 36	Rack 36	ON	OFF	OFF	OFF	OFF	ON
		Rack 37	Rack 37	OFF	OFF	OFF	OFF	OFF	ON
See note 1 – Rack addresses 40 thru 76 are only available in Standard mode.			Rack 40	ON	ON	ON	ON	ON	OFF
			Rack 41	OFF	ON	ON	ON	ON	OFF
			Rack 42	ON	OFF	ON	ON	ON	OFF
			Rack 43	OFF	OFF	ON	ON	ON	OFF
			Rack 44	ON	ON	OFF	ON	ON	OFF
			Rack 45	OFF	ON	OFF	ON	ON	OFF
			Rack 46	ON	OFF	OFF	ON	ON	OFF
			Rack 47	OFF	OFF	OFF	ON	ON	OFF
			Rack 50	ON	ON	ON	OFF	ON	OFF
			Rack 51	OFF	ON	ON	OFF	ON	OFF

Rack Number				S1 Switch Position					
1747-SN	PLC–5	PLC–5/250	PLC–3	6	5	4	3	2	1
			Rack 52	ON	OFF	ON	OFF	ON	OFF
			Rack 53	OFF	OFF	ON	OFF	ON	OFF
			Rack 54	ON	ON	OFF	OFF	ON	OFF
			Rack 55	OFF	ON	OFF	OFF	ON	OFF
			Rack 56	ON	OFF	OFF	OFF	ON	OFF
			Rack 57	OFF	OFF	OFF	OFF	ON	OFF
			Rack 60	ON	ON	ON	ON	OFF	OFF
			Rack 61	OFF	ON	ON	ON	OFF	OFF
			Rack 62	ON	OFF	ON	ON	OFF	OFF
			Rack 63	OFF	OFF	ON	ON	OFF	OFF
			Rack 64	ON	ON	OFF	ON	OFF	OFF
			Rack 65	OFF	ON	OFF	ON	OFF	OFF
			Rack 66	ON	OFF	OFF	ON	OFF	OFF
			Rack 67	OFF	OFF	OFF	ON	OFF	OFF
			Rack 70	ON	ON	ON	OFF	OFF	OFF
			Rack 71	OFF	ON	ON	OFF	OFF	OFF
			Rack 72	ON	OFF	ON	OFF	OFF	OFF
			Rack 73	OFF	OFF	ON	OFF	OFF	OFF
			Rack 74	ON	ON	OFF	OFF	OFF	OFF
			Rack 75	OFF	ON	OFF	OFF	OFF	OFF
			Rack 76	ON	OFF	OFF	OFF	OFF	OFF
			Not Valid	OFF	OFF	OFF	OFF	OFF	OFF

Rack address 77 is an illegal configuration.
PLC-5/11 processors can scan rack 03.
PLC-5/15 and PLC-5/20 processors can scan racks 01–03.
PLC-5/25 and PLC-5/30 processors can scan racks 01–07.
PLC-5/40 and PLC-5/40L processors can scan racks 01–17.
PLC-5/60 and PLC-5/60L processors can scan racks 01–27.
PLC-5/80 processors can scan racks 01–27.
PLC-5/250 processors can scan racks 00–37.
Note 1 – Rack switch 1–1 is used to set a mode in this adapter. As a result. rack addresses from 40 to 76 are only available in Standard mode.

Complementary I/O Rack Addressing for PLC-5 Processors (refer to your processor or scanner documentation for all other processors)

Primary Rack

Rack Number		S1 Switch Position					
1747-SN	**PLC–5**	**6**	**5**	**4**	**3**	**2**	**1**
Rack 0	Not Valid	ON	ON	ON	ON	ON	OFF
Rack 1	Rack 1	OFF	ON	ON	ON	ON	OFF
Rack 2	Rack 2	ON	OFF	ON	ON	ON	OFF
Rack 3	Rack 3	OFF	OFF	ON	ON	ON	OFF
	Rack 4	ON	ON	OFF	ON	ON	OFF
	Rack 5	OFF	ON	OFF	ON	ON	OFF
	Rack 6	ON	OFF	OFF	ON	ON	OFF
	Rack 7	OFF	OFF	OFF	ON	ON	OFF

Complementary Rack

Rack Number		S1 Switch Position					
1747-SN	**PLC–5**	**6**	**5**	**4**	**3**	**2**	**1**
Rack 0	Not Valid	ON	ON	ON	OFF	ON	ON
Rack 1	Rack 1	OFF	ON	ON	OFF	ON	ON
Rack 2	Rack 2	ON	OFF	ON	OFF	ON	ON
Rack 3	Rack 3	OFF	OFF	ON	OFF	ON	ON
	Rack 4	ON	ON	OFF	OFF	ON	ON
	Rack 5	OFF	ON	OFF	OFF	ON	ON
	Rack 6	ON	OFF	OFF	OFF	ON	ON
	Rack 7	OFF	OFF	OFF	OFF	ON	ON

CSA Hazardous Location Approval

CSA® certifies products for general use as well as for use in hazardous locations. **Actual CSA certification is indicated by the product label** as shown below, and not by statements in any user documentation.

Example of the CSA certification product label

To comply with CSA certification for use in hazardous locations, the following information becomes a part of the product literature for CSA-certified Allen-Bradley industrial control products.

- This equipment is suitable for use in Class I, Division 2,
  Groups A, B, C, D, or non-hazardous locations only.
- The products having the appropriate CSA markings (that is, Class I Division 2, Groups A, B, C, D), are certified for use in other equipment where the suitability of combination (that is, application or use) is determined by the CSA or the local inspection office having jurisdiction.

Important: Due to the modular nature of a PLC® control system, the product with the highest temperature rating determines the overall temperature code rating of a PLC control system in a Class I, Division 2 location. The temperature code rating is marked on the product label
as shown.

Temperature code rating

Look for temperature code
rating here

The following warnings apply to products having CSA certification for use in hazardous locations.

CSA Hazardous Location Approval

ATTENTION: Explosion hazard —

- Substitution of components may impair suitability for Class I, Division 2.
- Do not replace components unless power has been switched off or the area is known to be non-hazardous.
- Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
- Do not disconnect connectors unless power has been switched off or the area is known to be non-hazardous. Secure any user-supplied connectors that mate to external circuits on an Allen-Bradley product using screws, sliding latches, threaded connectors, or other means such that any connection can withstand a 15 Newton (3.4 lb.) separating force applied for a minimum of one minute.

Approbation d'utilisation dans des emplacements dangereux par la CSA

La CSA® certifie les produits d'utilisation générale aussi bien que ceux qui s'utilisent dans des emplacements dangereux. **La certification CSA en vigueur est indiquée par l'étiquette du produit** et non par des affirmations dans la documentation à l'usage des utilisateurs.

Exemple d'étiquette de certification d'un produit par la CSA

Pour satisfaire à la certification de la CSA dans des endroits dangereux, les informations suivantes font partie intégrante de la documentation des produits industriels de contrôle Allen-Bradley certifiés par la CSA.

- Cet équipement convient à l'utilisation dans des emplacements de Classe 1, Division 2, Groupes A, B, C, D, ou ne convient qu'à l'utilisation dans des endroits non dangereux.
- Les produits portant le marquage approprié de la CSA (c'est à dire, Classe 1, Division 2, Groupes A, B, C, D) sont certifiés à l'utilisation pour d'autres équipements où la convenance de combinaison (application ou utilisation) est déterminée par la CSA ou le bureau local d'inspection qualifié.

Important: Par suite de la nature modulaire du système de contrôle PLC®, le produit ayant le taux le plus élevé de température détermine le taux d'ensemble du code de température du système de contrôle d'un PLC dans un emplacement de Classe 1, Division 2. Le taux du code de température est indiqué sur l'étiquette du produit.

CSA Hazardous Location Approval

Approbation d'utilisation dans des emplacements dangereux par la CSA

Taux du code de température

CL 1 DIV 2
GP A,B,C,D
TEMP

Le taux du code de
température est indiqué ici
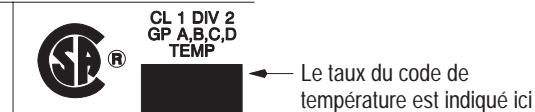
Les avertissements suivants s'appliquent aux produits ayant la certification CSA pour leur utilisation dans des emplacements dangereux.

AVERTISSEMENT: Risque d'explosion —

- La substitution de composants peut rendre ce matériel inacceptable pour lesemplacements de Classe I, Division 2.
- Couper le courant ou s'assurer quel'emplacement est désigné non dangereux avant de remplacer lescomposants.
- Avant de débrancher l'équipement, couper le courant ou s'assurer que l'emplacement est désigné non dangereux.
- Avant de débrancher les connecteurs, couper le courant ou s'assurer que l'emplacement est reconnu non dangereux. Attacher tous connecteurs fournis par l'utilisateur et reliés aux circuits externes d'un appareil Allen-Bradley à l 'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens permettant aux connexions de résister à une force de séparation de 15 newtons (3,4 lb. - 1,5 kg) appliquée pendant au moins une minute.

Le sigle CSA est la marque déposée de l'Association des Standards pour le Canada.
PLC est une marque déposée de Allen-Bradley Company, Inc.
CSA logo is a registered trademark of the Canadian Standards Association
PLC is a registered trademark of Allen-Bradley Company, Inc.

1794-ASB Series D Specifications

Note: This adapter cannot be used with PLC-2 processors This adapter can communicate with FLEX Integra analog modules.

I/O Capacity	8 modules
Power Supply	**Note:** In order to comply with CE Low Voltage Directives, you must use a Safety Extra Low Voltage (SELV) or a Protected Extra Low Voltage (PELV) power supply to power this adapter.
Input Voltage Rating	24V dc nominal
Input Voltage Range	19.2V to 31.2V dc (includes 5% ac ripple)
Communication Rate	57.6k bps 115.2k bps 230.4k bps
Indicators	Adapter Active – green Adapter fault – red Local fault – red
Flexbus Output Current	640mA maximum
Isolation Voltage	500V ac between user power and flexbus
Power Consumption	450mA maximum from external 24V supply
Power Dissipation	4.6W maximum @ 31.2V dc
Thermal Dissipation	15.7 BTU/hr @ 31.2V dc

Environmental Conditions
   Operational Temperature
   Storage Temperature
   Relative Humidity
   Shock   Operating
                Non-operating
   Vibration
	
	0 to 55ºC (32 to 131ºF)
	–40 to 85ºC (–40 to 185ºF)
	5 to 95% noncondensing
	30 g peak acceleration, 11($\pm$1)ms pulse width
	50 g peak acceleration, 11($\pm$1)ms pulse width
	Tested 5 g @ 10–500Hz per IEC 68-2-6

Remote I/O Cable	Belden 9463 or equivalent as specified in publication ICCG-2.2
Remote I/O Connector Plug	Part Number 942029–03

Power Conductors
   Wire Size
 	
   Category
	
	12 gauge (4mm^2) stranded maximum
	3/64 inch (1.2mm) insulation max.
	2[1]

Specifications continued on next page

1794-ASB Series D Specifications	
Agency Certification (when product or packaging is marked)	• CSA certified • CSA Class I, Division 2 Groups A, B, C, D certified • UL listed • CE marked for all applicable directives
User Manual	Publication 1794-6.5.9

1 Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines."

Mounting Dimensions

1794-ASB/D
3.4H x 2.7W x 2.7D
(87H x 68W x 69D)
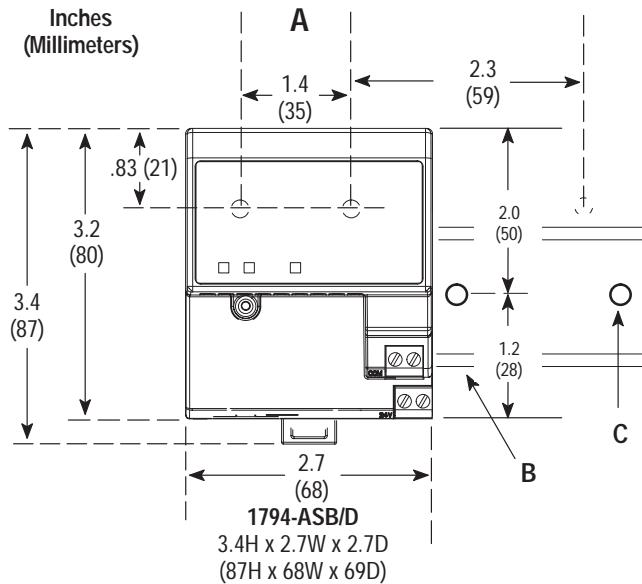
A = Mounting hole dimensions for optional mounting kit
B = DIN rail
C = Secure DIN rail approximately every 200mm

User Manuals

Thank you for purchasing this product. This product has a user manual associated with it. If you would like a manual, you can:

- download a free electronic version from the internet::
  `www.ab.com/manuals` or
  `www.theautomationbookstore.com`
- purchase a printed manual by:
  - contacting your local distributor or Rockwell Automation representative,
  - visiting `www.theautomationbookstore.com` and placing your order
  - calling 1.800.963.9548 (USA/Canada) or 001.330.725.1574 (Outside USA/Canada)

The publication number of the user manual for your product is listed under "Specifications" in this installation instruction shipped with your product.

Rockwell Automation

Allen-Bradley

With major offices worldwide. ━━━━━

World Headquarters,
Allen-Bradley,
1201 South Second Street,
Milwaukee, WI 53204 USA,
Tel: (1) 414 382-2000 Fax: (1) 414 382-4444